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EXAMINER
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MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/30/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/931,470

Applicant(s)

FAYKOSH ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,938,851 to Moshtagh.
3. Moshtagh discloses a chemical vapor deposition system in Figure 2, comprising: a housing that defines an enclosed deposition chamber (16) and includes a lower portion (not numbered, below 74 and to the outside of 20) and an upper portion (12) having a horizontal junction (at 74) with each other; a seal assembly (flange 74 and unnumbered flange below 74) that extends between the lower and upper housings at their horizontal junction; a roll conveyor (24) located within the deposition chamber to convey glass sheet substrates along a direction of conveyance below the horizontal junction of the lower and upper housing portions where the seal assembly is located; a chemical vapor deposition distributor (14) located within the deposition chamber above the roll conveyor to provide chemical vapor deposition coating on the conveyed glass substrates; the housing including an entry (not numbered, left side of Figure 2) through which the glass sheet substrates to be coated are introduced into the deposition chamber at a location located below the horizontal junction of the lower and upper housing portions where the seal assembly is located; and the housing including an exit (right side of Figure 2) through which the coated glass sheet substrates leave the deposition chamber at a location below the horizontal junction of the lower and upper housing portions where the seal assembly is located.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh as applied to claim 1 above, and further in view of U.S. Patent No. 4,558,660 to Nishizawa et al. and U.S. Patent No. 5,368,648 to Sekizuka and U.S. Patent No. 5,614,249 to Mayeda.

6. Moshtagh discloses the invention substantially as claimed and as described above.

7. However, Moshtagh fails to teach a vacuum source for drawing a vacuum within the deposition chamber.

8. Nishizawa et al. teach the use of vacuum means connected to the interior of a reaction chamber for the purpose of evacuating the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to a commencement of reaction (claim 1, column 16, rows 5-9).

9. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided vacuum means in Moshtagh in order to evacuate the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to commencement of the reaction as taught by Nishizawa et al.

10. Moshtagh further fails to teach the seal assembly between the lower and upper housing portions including inner and outer seal members spaced from each other to define an intermediate seal space that is located between the deposition chamber and the ambient and in which a vacuum is drawn to a lesser extent than in the deposition chamber.

11. Sekizuka discloses a sealing assembly comprising two sealing members with the space between evacuated to vacuum (column 2, rows 40-47) for the purpose of further heightening of a sealing effect

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and to prevent mixing of air or the like from the atmosphere to the inside the process tube of the process container and to obtain a more definite sealing function.

12. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sealing assembly including two sealing members with the space between them evacuated to vacuum in Moshtagh in order to heighten a sealing effect, prevent mixing of air or the like from the atmosphere to the inside of the process tube of the process container, and to obtain a more definite sealing effect as taught by Sekizuka.

13. Examiner recognizes that Sekizuka does not specifically teach the space between the sealing members being evacuated to a vacuum to a lesser extent than in the deposition chamber as recited in the claim. However, this recitation is not viewed as a further structural limitation of the claim, rather as an intended use of the apparatus.

14. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2d 1647 (Bd. Pat App. & Inter. 1987).

15. Moshtagh further fails to teach a sensor for detection the pressure within the seal space to sense leakage of either the inner seal member of the outer seal member.

16. Mayeda discloses a leak detection system for a CVD apparatus for the purpose of checking multiple seals and determining a leak with an increased degree of reliability and locating a leak more precisely, wherein these determinations allow disassembly only when necessary and at the location of the leak (column 2, rows 34-40).

17. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sensor for detection of the failure of one of several seals in Moshtagh in order to determine a leak with increased reliability and locate a leak more precisely as taught by Mayeda.

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18. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 2 above, and further in view of U.S. Patent No. 4,040,372 to Flanders.

19. The prior art discloses the invention substantially as claimed and as described above, including an upper seal flange (74) and a lower seal flange (unnumbered, directly below 74 in Moshtagh).

20. However, the prior art fails to teach the use of clamps extending between the lower and upper seal flanges, wherein the clamps include a hydraulic cylinder.

21. Flanders discloses the use of a clamp with a hydraulic cylinder for the purpose of connecting two flanges with a tight, leak-proof and tamper-resistant seal (abstract).

22. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a clamp with a hydraulic cylinder in the prior art in order to connect two flanges with a tight, leak-proof and tamper-resistant seal as taught by Flanders.

23. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh, Sekizuka, Mayeda and Flanders as applied to claims 3 and 4 above, and further in view of U.S. Patent No. 4,591,374 to Klemola.

24. The prior art discloses the invention substantially as claimed and as described above.

25. However, the prior art fails to teach an oven located within the housing and having elongated heaters that extend along the direction of conveyance in laterally spaced banks.

26. Klemola discloses the use of an oven with elongated heaters (5 and 6) that extend along the direction of conveyance in laterally spaced banks (a top bank and a bottom bank) for the purpose of equalizing the temperature of the conveyor rolls (abstract).

27. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided laterally spaced banks of elongated heaters in the prior art in order to equalize the temperature of conveyor rolls as taught by Klemola.

28. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 5 above, and further in view of U.S. Patent No. 3,541,293 to MacDonald et al.

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29. The prior art discloses the invention substantially as claimed and as described above including the electrical resistance heaters.

30. However, the prior art fails to teach each of the heaters including a quartz tube through which the electric resistance element extends.

31. MacDonald et al. teaches extending a electrical resistance heater through a quartz tube for the purpose of maximum protection against shock and vibration, wherein quartz is used as a material because of its high heat conductivity characteristics and its semi-transparency (column 1, rows 56-72).

32. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided quartz tubes around the electrical resistance heaters in the prior art in order to provide maximum protection against shock and vibration as taught by MacDonald et al.

33. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 6 above, and further in view of U.S. Patent No. 5,028,250 to Deb et al.

34. The prior art disclose the invention substantially as claimed and as described above.

35. However, the prior art fails to teach the conveyor rolls extending through the oven and having ends projecting outwardly therefrom and a drive mechanism that rotatively drives the roll ends outwardly of the oven.

36. Deb et al. disclose an oven with a roller conveyers (79 and 81, Figures 2 and 4) and roller conveyor driving mechanism (Figure 1, 116) with the ends of the roller conveyors extending outwardly of the oven and the novel roller conveyor mechanism and drive system are adapted as such for the purpose of providing a positive interrelated drive for the gallery of rollers while facilitating rapid removal and replacement of selected individual rollers as becomes necessary (column 1, rows 62-68 and column 6, row 61 through column 7, row 10).

37. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a roller conveyor mechanism with roller conveyors which extend outside the oven/chamber and a drive mechanism which rotatively drives the roller conveyors in the prior art in order

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to of provide a positive interrelated drive for the gallery of rollers while facilitating rapid removal and replacement of selected individual rollers as becomes necessary as taught by Deb et al.

38. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 7 above, and further in view of U.S. Patent No. 4,591,374 to Klemola.

39. The prior art discloses the invention substantially as claimed and as described above.

40. However, the prior art fails to teach a screen that is located below the roll conveyor to catch any broken glass sheet substrates.

41. Klemola discloses the use of a screen plates made of a heat resistant steel for the purpose if protecting heating resistors form broken glass (column 1, rows 54-68).

42. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a screen plate of heat resistant steel in the prior art in order to protect heating resistors form broken glass as taught by Klemola et al.

43. With respect to claim 9, Klemola does not explicitly teach the use of stainless steel; however, the courts have ruled that the selection of a known material based on its suitability for its intended use is prima facie obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). The courts have further ruled that reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle. 325 U.S. 335, 65 USPQ at 301.

44. With respect to the stainless steel including "stiffeners", due to minimal explanation of what Applicant means by "stiffeners", they have been interpreted as, "any one of the alloys which are a part of stainless steel and are provided because of their ability to impart strength/stiffness to the alloy". These stiffeners would be inherent in the selection of stainless steel as a material for a protecting screen.

45. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,938,851 to Moshtagh, in view of U.S. Patent No. 4,558,660 to Nishizawa et al., U.S. Patent No. 5,368,648 to Sekizuka and U.S. Patent No. 5,614,249 to Mayeda.



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46. Moshtagh discloses a chemical vapor deposition system in Figure 2, comprising: a housing that defines an enclosed deposition chamber (16) and includes a lower portion (not numbered, below 74 and to the outside of 20) and an upper portion (12) having a horizontal junction (at 74) with each other; a seal assembly (flange 74 and unnumbered flange below 74) that extends between the lower and upper housings at their horizontal junction; a roll conveyor (24) located within the deposition chamber to convey glass sheet substrates along a direction of conveyance below the horizontal junction of the lower and upper housing portions where the seal assembly is located; a chemical vapor deposition distributor (14) located within the deposition chamber above the roll conveyor to provide chemical vapor deposition coating on the conveyed glass substrates; the housing including an entry (not numbered, left side of Figure 2) through which the glass sheet substrates to be coated are introduced into the deposition chamber at a location located below the horizontal junction of the lower and upper housing portions where the seal assembly is located; and the housing including an exit (right side of Figure 2) through which the coated glass sheet substrates leave the deposition chamber at a location below the horizontal junction of the lower and upper housing portions where the seal assembly is located. Moshtagh further discloses an upper seal flange (74) and a lower seal flange (unnumbered, directly below 74 in Moshtagh).

47. Moshtagh discloses the invention substantially as claimed and as described above.

48. However, Moshtagh fails to teach a vacuum source for drawing a vacuum within the deposition chamber.

49. Nishizawa et al. teach the use of vacuum means connected to the interior of a reaction chamber for the purpose of evacuating the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to a commencement of reaction (claim 1, column 16, rows 5-9).

50. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided vacuum means in Moshtagh in order to evacuate the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to commencement of the reaction as taught by Nishizawa et al.

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51. Moshtagh further fails to teach the seal assembly between the lower and upper housing portions including inner and outer seal members spaced from each other to define an intermediate seal space that is located between the deposition chamber and the ambient and in which a vacuum is drawn to a lesser extent than in the deposition chamber.

52. Sekizuka discloses a sealing assembly comprising two sealing members with the space between evacuated to vacuum (column 2, rows 40-47) for the purpose of further heightening of a sealing effect and to prevent mixing of air or the like from the atmosphere to the inside the process tube of the process container and to obtain a more definite sealing function.

53. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sealing assembly including two sealing members with the space between them evacuated to vacuum in Moshtagh in order to heighten a sealing effect, prevent mixing of air or the like from the atmosphere to the inside of the process tube of the process container, and to obtain a more definite sealing effect as taught by Sekizuka.

54. Examiner recognizes that Sekizuka does not specifically teach the space between the sealing members being evacuated to a vacuum to a lesser extent than in the deposition chamber as recited in the claim. However, this recitation is not viewed as a further structural limitation of the claim, rather as an intended use of the apparatus.

55. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2d 1647 (Bd. Pat App. & Inter. 1987).

56. Moshtagh further fails to teach a sensor for detection the pressure within the seal space to sense leakage of either the inner seal member or the outer seal member.

57. Mayeda discloses a leak detection system for a CVD apparatus for the purpose of checking multiple seals and determining a leak with an increased degree of reliability and locating a leak more

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precisely, wherein these determinations allow disassembly only when necessary and at the location of the leak (column 2, rows 34-40).

58. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sensor for detection of the failure of one of several seals in Moshtagh in order to determine a leak with increased reliability and locate a leak more precisely as taught by Mayeda.

59. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,938,851 to Moshtagh, in view of U.S. Patent No. 4,558,660 to Nishizawa et al., U.S. Patent No. 5,368,648 to Sekizuka, U.S. Patent No. 5,614,249 to Mayeda further in view of U.S. Patent No. 4,591,374 to Klemola and U.S. Patent No. 3,541,293 to MacDonald et al.

60. Moshtagh discloses a chemical vapor deposition system in Figure 2, comprising: a housing that defines an enclosed deposition chamber (16) and includes a lower portion (not numbered, below 74 and to the outside of 20) and an upper portion (12) having a horizontal junction (at 74) with each other; a seal assembly (flange 74 and unnumbered flange below 74) that extends between the lower and upper housings at their horizontal junction; a roll conveyor (24) located within the deposition chamber to convey glass sheet substrates along a direction of conveyance below the horizontal junction of the lower and upper housing portions where the seal assembly is located; a chemical vapor deposition distributor (14) located within the deposition chamber above the roll conveyor to provide chemical vapor deposition coating on the conveyed glass substrates; the housing including an entry (not numbered, left side of Figure 2) through which the glass sheet substrates to be coated are introduced into the deposition chamber at a location located below the horizontal junction of the lower and upper housing portions where the seal assembly is located; and the housing including an exit (right side of Figure 2) through which the coated glass sheet substrates leave the deposition chamber at a location below the horizontal junction of the lower and upper housing portions where the seal assembly is located.

61. Moshtagh discloses the invention substantially as claimed and as described above.

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62. However, Moshtagh fails to teach a vacuum source for drawing a vacuum within the deposition chamber.

63. Nishizawa et al. teach the use of vacuum means connected to the interior of a reaction chamber for the purpose of evacuating the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to a commencement of reaction (claim 1, column 16, rows 5-9).

64. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided vacuum means in Moshtagh in order to evacuate the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to commencement of the reaction as taught by Nishizawa et al.

65. Moshtagh further fails to teach the seal assembly between the lower and upper housing portions including inner and outer seal members spaced from each other to define an intermediate seal space that is located between the deposition chamber and the ambient and in which a vacuum is drawn to a lesser extent than in the deposition chamber.

66. Sekizuka discloses a sealing assembly comprising two sealing members with the space between evacuated to vacuum (column 2, rows 40-47) for the purpose of further heightening of a sealing effect and to prevent mixing of air or the like from the atmosphere to the inside the process tube of the process container and to obtain a more definite sealing function.

67. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sealing assembly including two sealing members with the space between them evacuated to vacuum in Moshtagh in order to heighten a sealing effect, prevent mixing of air or the like from the atmosphere to the inside of the process tube of the process container, and to obtain a more definite sealing effect as taught by Sekizuka.

68. Examiner recognizes that Sekizuka does not specifically teach the space between the sealing members being evacuated to a vacuum to a lesser extent than in the deposition chamber as recited in the claim. However, this recitation is not viewed as a further structural limitation of the claim, rather as an intended use of the apparatus.

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69. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2d 1647 (Bd. Pat App. & Inter. 1987).

70. Moshtagh further fails to teach a sensor for detection the pressure within the seal space to sense leakage of either the inner seal member of the outer seal member.

71. Mayeda discloses a leak detection system for a CVD apparatus for the purpose of checking multiple seals and determining a leak with an increased degree of reliability and locating a leak more precisely, wherein these determinations allow disassembly only when necessary and at the location of the leak (column 2, rows 34-40).

72. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sensor for detection of the failure of one of several seals in Moshtagh in order to determine a leak with increased reliability and locate a leak more precisely as taught by Mayeda.

73. The prior art discloses the invention substantially as claimed and as described above, including an upper seal flange (74) and a lower seal flange (unnumbered, directly below 74 in Moshtagh).

74. However, the prior art fails to teach the use of clamps extending between the lower and upper seal flanges, wherein the clamps include a hydraulic cylinder.

75. Flanders discloses the use of a clamp with a hydraulic cylinder for the purpose of connecting two flanges with a tight, leak-proof and tamper-resistant seal (abstract).

76. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a clamp with a hydraulic cylinder in the prior art in order to connect two flanges with a tight, leak-proof and tamper-resistant seal as taught by Flanders.

77. The prior art discloses the invention substantially as claimed and as described above.

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78. However, the prior art fails to teach an oven located within the housing and having elongated heaters that extend along the direction of conveyance in laterally spaced banks.

79. Klemola discloses the use of an oven with elongated heaters (5 and 6) that extend along the direction of conveyance in laterally spaced banks (a top bank and a bottom bank) for the purpose of equalizing the temperature of the conveyor rolls (abstract).

80. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided laterally spaced banks of elongated heaters in the prior art in order to equalize the temperature of conveyor rolls as taught by Klemola.

81. The prior art discloses the invention substantially as claimed and as described above including the electrical resistance heaters.

82. However, the prior art fails to teach each of the heaters including a quartz tube through which the electric resistance element extends.

83. MacDonald et al. teaches extending a electrical resistance heater through a quartz tube for the purpose of maximum protection against shock and vibration, wherein quartz is used as a material because of its high heat conductivity characteristics and its semi-transparency (column 1, rows 56-72).

84. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided quartz tubes around the electrical resistance heaters in the prior art in order to provide maximum protection against shock and vibration as taught by MacDonald et al.

85. Claims 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,938,851 to Moshtagh, in view of U.S. Patent No. 4,558,660 to Nishizawa et al., U.S. Patent No. 5,368,648 to Sekizuka, U.S. Patent No. 5,614,249 to Mayeda, U.S. Patent No. 4,040,372 to Flanders, U.S. Patent No. 4,591,374 to Klemola and U.S. Patent No. 3,541,293 to MacDonald et al.

86. Moshtagh discloses a chemical vapor deposition system in Figure 2, comprising: a housing that defines an enclosed deposition chamber (16) and includes a lower portion (not numbered, below 74 and to the outside of 20) and an upper portion (12) having a horizontal junction (at 74) with each other; a seal

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assembly (flange 74 and unnumbered flange below 74) that extends between the lower and upper housings at their horizontal junction' a roll conveyor (24) located within the deposition chamber to convey glass sheet substrates along a direction of conveyance below the horizontal junction of the lower and upper housing portions where the seal assembly is located; a chemical vapor deposition distributor (14) located within the deposition chamber above the roll conveyor to provide chemical vapor deposition coating on the conveyed glass substrates; the housing including an entry (not numbered, left side of Figure 2) through which the glass sheet substrates to be coated are introduced into the deposition chamber at a location located below the horizontal junction of the lower and upper housing portions where the seal assembly is located; and the housing including an exit (right side of Figure 2) through which the coated glass sheet substrates leave the deposition chamber at a location below the horizontal junction of the lower and upper housing portions where the seal assembly is located.

87. Moshtagh discloses the invention substantially as claimed and as described above.

88. However, Moshtagh fails to teach a vacuum source for drawing a vacuum within the deposition chamber.

89. Nishizawa et al. teach the use of vacuum means connected to the interior of a reaction chamber for the purpose of evacuating the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to a commencement of reaction (claim 1, column 16, rows 5-9).

90. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided vacuum means in Moshtagh in order to evacuate the interior of the reaction chamber to maintain an inner pressure thereof at a super low pressure prior to commencement of the reaction as taught by Nishizawa et al.

91. Moshtagh further fails to teach the seal assembly between the lower and upper housing portions including inner and outer seal members spaced from each other to define an intermediate seal space that is located between the deposition chamber and the ambient and in which a vacuum is drawn to a lesser extent than in the deposition chamber.

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92. Sekizuka discloses a sealing assembly comprising two sealing members with the space between evacuated to vacuum (column 2, rows 40-47) for the purpose of further heightening of a sealing effect and to prevent mixing of air or the like from the atmosphere to the inside the process tube of the process container and to obtain a more definite sealing function.

93. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sealing assembly including two sealing members with the space between them evacuated to vacuum in Moshtagh in order to heighten a sealing effect, prevent mixing of air or the like from the atmosphere to the inside of the process tube of the process container, and to obtain a more definite sealing effect as taught by Sekizuka.

94. Examiner recognizes that Sekizuka does not specifically teach the space between the sealing members being evacuated to a vacuum to a lesser extent than in the deposition chamber as recited in the claim. However, this recitation is not viewed as a further structural limitation of the claim, rather as an intended use of the apparatus.

95. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2d 1647 (Bd. Pat App. & Inter. 1987).

96. Moshtagh further fails to teach a sensor for detection the pressure within the seal space to sense leakage of either the inner seal member of the outer seal member.

97. Mayeda discloses a leak detection system for a CVD apparatus for the purpose of checking multiple seals and determining a leak with an increased degree of reliability and locating a leak more precisely, wherein these determinations allow disassembly only when necessary and at the location of the leak (column 2, rows 34-40).

98. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a sensor for detection of the failure of one of several seals in Moshtagh in order to determine a leak with increased reliability and locate a leak more precisely as taught by Mayeda.



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99. The prior art discloses the invention substantially as claimed and as described above, including an upper seal flange (74) and a lower seal flange (unnumbered, directly below 74 in Moshtagh).

100. However, the prior art fails to teach the use of clamps extending between the lower and upper seal flanges, wherein the clamps include a hydraulic cylinder.

101. Flanders discloses the use of a clamp with a hydraulic cylinder for the purpose of connecting two flanges with a tight, leak-proof and tamper-resistant seal (abstract).

102. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a clamp with a hydraulic cylinder in the prior art in order to connect two flanges with a tight, leak-proof and tamper-resistant seal as taught by Flanders.

103. The prior art discloses the invention substantially as claimed and as described above.

104. However, the prior art fails to teach a screen located below the roll conveyor to catch any broken glass sheet substrates or an oven located within the housing and having elongated heaters that extend along the direction of conveyance in laterally spaced banks.

105. Klemola discloses the use of a screen plates made of a heat resistant steel for the purposes of eliminating unequal thermal distribution and thermal stresses in a substrate being processed (column 2, rows 33-38) and protecting heating resistors from broken glass (column 1, rows 54-68).

106. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a screen plate of heat resistant steel in the prior art in order to protect heating resistors from broken glass as taught by Klemola et al.

107. Additionally, with respect to claim 17, the specific size of the screen openings, Klemola teaches that to obtain proper screening the screen plates can be provided with holes and that the desired hole distribution and size can be selected based on the heating and cooling requirements of the system (column 2, row 66 through column 3, row 7). Further, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

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108. Klemola discloses the use of an oven with elongated heaters (5 and 6) that extend along the direction of conveyance in laterally spaced banks (a top bank and a bottom bank) for the purpose of equalizing the temperature of the conveyor rolls (abstract).

109. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided laterally spaced banks of elongated heaters in the prior art in order to equalize the temperature of conveyor rolls as taught by Klemola.

110. The prior art discloses the invention substantially as claimed and as described above including the electrical resistance heaters.

111. However, the prior art fails to teach each of the heaters including a quartz tube through which the electric resistance element extends.

112. MacDonald et al. teaches extending a electrical resistance heater through a quartz tube for the purpose of maximum protection against shock and vibration, wherein quartz is used as a material because of its high heat conductivity characteristics and its semi-transparency (column 1, rows 56-72).

113. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided quartz tubes around the electrical resistance heaters in the prior art in order to provide maximum protection against shock and vibration as taught by MacDonald et al.

114. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh as applied to claim 1 above in view of U.S. Patent No. 5,589,007 to Fujioka et al.

115. Moshtagh discloses the invention substantially as claimed and as described above.

116. However, Moshtagh fails to teach the entry and exit further comprising load lock cells.

117. Fujioka et al. teach an apparatus with a load lock configuration for the purpose of preventing air with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber (column 48, rows 19-33).

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118. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided entry and exit load lock cells in Moshtagh in order to prevent with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber as taught by Fujioka et al.

119. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh as applied to claim 1 above, and further in view of U.S. Patent No. 3,658,585 to Folkmann et al.

120. Moshtagh discloses the invention substantially as claimed and as described above.

121. However, Moshtagh fails to teach the chemical vapor distributor has an opposing pair of inlets.

122. Folkmann et al. teach the use of an opposing pair of inlets for the purpose of preventing an inhomogeneous film from forming by allowing the reaction gas to flow in opposite directions over a substrate for equal periods of time (column 1, rows 28-36) and also to allow the reaction gas introduced through one inlet to be exhausted through the opposing inlet when the opposing inlet is connected with a gas outlet (column 2, rows 33-44).

123. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided opposing inlets in Moshtagh in order to prevent an inhomogeneous film from forming by allowing the reaction gas to flow in opposite directions over a substrate for equal periods of time (column 1, rows 28-36) and also to allow the reaction gas introduced through one inlet to be exhausted through the opposing inlet when the opposing inlet is connected with a gas outlet as taught by Folkmann et al.

124. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh, Nishizawa et al., Sekizuka, Mayeda, Flanders, Klemola and MacDonald et al. as applied to claims 12 and 17 above, and further in view of U.S. Patent No. 5,589,007 to Fujioka et al.

125. The prior art discloses the invention substantially as claimed and as described above.

126. However, Moshtagh fails to teach the entry and exit further comprising load lock cells.

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127. Fujioka et al. teach an apparatus with a load lock configuration for the purpose of preventing air with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber (column 48, rows 19-33).

128. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided entry and exit load lock cells in Moshtagh in order to prevent with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber as taught by Fujioka et al.

129. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh, Nishizawa et al., Sekizuka, Mayeda, Flanders, Klemola and MacDonald et al. as applied to claims 12 and 17 above, and further in view of U.S. Patent No. 3,658,585 to Folkmann et al.

130. Moshtagh discloses the invention substantially as claimed and as described above.

131. However, Moshtagh fails to teach the chemical vapor distributor has an opposing pair of inlets.

132. Folkmann et al. teach the use of an opposing pair of inlets for the purpose of preventing an inhomogeneous film from forming by allowing the reaction gas to flow in opposite directions over a substrate for equal periods of time (column 1, rows 28-36) and also to allow the reaction gas introduced through one inlet to be exhausted through the opposing inlet when the opposing inlet is connected with a gas outlet (column 2, rows 33-44).

133. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided opposing inlets in Moshtagh in order to prevent an inhomogeneous film from forming by allowing the reaction gas to flow in opposite directions over a substrate for equal periods of time (column 1, rows 28-36) and also to allow the reaction gas introduced through one inlet to be exhausted through the opposing inlet when the opposing inlet is connected with a gas outlet as taught by Folkmann et al.

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134. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshtagh as applied to claims 1 and 15 above, in view of U.S. Patent No. 5,589,007 to Fujioka et al.

135. The prior art discloses the invention substantially as claimed and as described above.

136. However, Moshtagh fails to teach the entry and exit further comprising load lock cells.

137. Fujioka et al. teach an apparatus with a load lock configuration for the purpose of preventing air with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber (column 48, rows 19-33).

138. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided entry and exit load lock cells in Moshtagh in order to prevent with impurities that is introduced into the system along with the substrate from entering the film-forming chambers and adsorbing on the inner walls of the film-forming chamber and affecting the characteristics for films formed within the chamber as taught by Fujioka et al.

#### ***Response to Arguments***

139. Applicant's arguments filed 05/14/03 have been fully considered but they are not persuasive.

Applicant argues that Moshtagh fails to disclose a seal assembly that extends between the lower (Figure 2, below 74 and to the outside of 20) and upper (12) housing portions at their horizontal junction.

Specifically, Applicant argues that what was characterized as the upper housing portion and lower housing portion in the previous office action is not a housing that defines a chamber. Examiner disagrees. The combination of the structures above do in fact connect and form a deposition chamber for performing a deposition process on a wafer. It is fair to say that the apparatus of the claimed invention and Moshtagh are not disclosed as connecting in the same manner. However, as claimed, the claimed invention does not define over Moshtagh.

140. Applicant further argues that Moshtagh does not disclose a seal assembly. Examiner regards the flange 74 and the unnumbered flange below flange 74 as the sealing assembly. Moshtagh teaches that the flanges are used to mount the upper and lower housings together (column 5, rows 5, rows 11-16).

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Again, it is fair to say that sealing assembly of Moshtagh is not identical to that of the claimed invention. However, as claimed, Moshtagh reads on the claims of the present application. Merriam-Webster's Online Dictionary defines a seal as "something that secures". Examiner is unable to find a different or more limiting definition in Applicant's specification and has thus used this as a basis for determining that the above-mentioned flanges do act as a sealing assembly.

#### ***Allowable Subject Matter***

141. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

142. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or fairly suggest the roll conveyor further comprises conveyor rolls, wherein the conveyor rolls have **annular radiation shield at locations adjacent to the chemical vapor distributor**.

#### ***Conclusion***

143. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km  
July 22, 2003

*Primary Examiner  
AU 1763  
P. Hassenzahl*